



CHEMISTRY NMDCAT

(UNIT-4)

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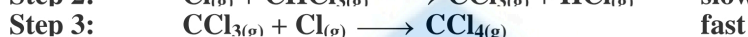
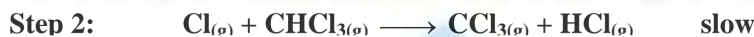
SAEED MDCAT

03418729745(WhatsApp Groups)

TOPICS

- ✓ **CHEMICAL EQUILIBRIUM**
- ✓ **CHEMICAL KINETICS**

- Q.1** Ionization of phenol can be decreased by adding
 a. Methanol
 b. Hydrochloric acid
 c. Toluene
 d. Benzyl alcohol
- Q.2** Self-ionization of water is $\text{H-OH} \rightleftharpoons \text{H}^+ + \text{OH}^-$. If strong base is added to water at given temperature, water will be basic and its K_w will
 a. Increase
 b. First increase and then constant
 c. Decrease
 d. Remain constant
- Q.3** If K_{sp} is equal to product of concentration of ions at particular temperature, then solution is
 a. Saturated
 b. Unsaturated
 c. Supersaturated
 d. Concentrated
- Q.4** Find the K_c of following reaction if equilibrium concentrations of acetic acid, ethanol, ethyl acetate and water are 1.5M, 1.5M, 2.5M and 2.5M respectively
 $\text{CH}_3\text{COOH} + \text{CH}_3\text{CH}_2\text{OH} \rightleftharpoons \text{CH}_3\text{COOCH}_2\text{CH}_3 + \text{H}_2\text{O}$
 a. 10
 b. 4.5
 c. 1
 d. 2.77
- Q.5** An addition of NH_4Cl in NH_4OH solution suppresses the concentration of
 a. $\text{Cl}^-_{(aq)}$
 b. $\text{OH}^-_{(aq)}$
 c. NH_4^+
 d. Both $\text{Cl}^-_{(aq)}$ and $\text{OH}^-_{(aq)}$
- Q.6** $\text{p}K_a$ values of four acids are given. Find the stronger one
 a. 0
 b. 9
 c. 3
 d. 1
- Q.7** The order of reaction may be determined by
 a. Differential
 b. Graphical method
 c. Half-life method
 d. All of these
- Q.8** Half-life of the reaction becomes half when initial concentrations of reactants are doubled. The order of the reaction will be
 a. First order
 b. Third order
 c. Second order
 d. Zero order
- Q.9** Which change will never happens to a catalyst during a reaction
 a. Appearance
 b. Chemical composition
 c. Surface area
 d. Physical state
- Q.10** Yield of ammonia in Haber's process can be increased by all except
 a. Decreasing temperature
 b. Adding nitrogen
 c. Adding catalyst
 d. Increasing pressure
- Q.11** If number of moles of reactants are greater than products, then relationship between K_n and K_c is
 a. $K_n > K_c$
 b. $K_n = K_c$
 c. $K_n \geq K_c$
 d. $K_n < K_c$
- Q.12** In Arrhenius equation $k = Ae^{-E_a/RT}$, depends upon collision frequency
 a. k
 b. e
 c. A
 d. E_a
- Q.13** Difference of energy between reactants and transition state is called
 a. Enthalpy of reaction
 b. Activation energy
 c. Kinetic energy
 d. Internal energy
- Q.14** In the hydrolysis of an organic chloride in the presence of large excess of water $\text{R}_3\text{C-Cl} + \text{H}_2\text{O} \rightarrow \text{R}_3\text{C-OH} + \text{HCl}$, order of reaction is
 a. Second order
 b. Third order
 c. First order
 d. Pseudo First order
- Q.15** The mechanism below has been proposed for the reaction of CHCl_3 with Cl_2
 Step I: $\text{Cl}_{2(g)} \rightleftharpoons 2\text{Cl}_{(g)}$ fast



Rate law for the reaction is

- a. Rate = $[\text{CHCl}_3][\text{Cl}]^2$ b. Rate = $[\text{CCl}_3][\text{Cl}]$
c. Rate = $[\text{CHCl}_3][\text{Cl}_2]^{1/2}$ d. Rate = $[\text{Cl}_2]$

Q.16 All are correct about zero order except

- a. All photochemical reactions are zero order
b. Rate is independent of concentration of reactant
c. Radioactive decay follows zero order
d. Half-life is directly proportional to initial concentration raised to power (1-n)

Q.17 If during reaction, there is rotation in plane polarized light, then its rate can be determined by

- a. Spectrometry method b. Optical rotation method
c. Electrical conductivity method d. Dilatometric method

Q.18 Autocatalysis is the phenomenon in which product formed acts as catalyst, which is autocatalyst in the following reaction



- a. K_2SO_4 b. CO_2
c. Mn^{+2} d. H_2O

Q.19 1.0g mole of ethyl alcohol and 1.0g mole of acetic acid are mixed. At equilibrium 0.666g mole of the ester is present. The value of equilibrium constant is

- a. $\frac{1}{2}$ c. 2
b. $\frac{1}{4}$ d. 4

Q.20 For third order reaction, rate constant has units

- a. $\text{mol dm}^{-3} \text{s}^{-1}$ b. $\text{mol}^{-1} \text{dm}^3 \text{s}^{-1}$
c. s^{-1} d. $\text{mol}^{-2} \text{dm}^6 \text{s}^{-1}$

Q.21 For a reaction like $\text{X} + 2\text{Y} \rightarrow \text{Z}$ Rate = $k[\text{X}]^0[\text{Y}]^2$

If concentration of X and Y is doubled, then rate of reaction will increase

- a. 8 times b. 4 times
c. 6 times d. 16 times

Q.22 $\text{CH}_3\text{COOC}_2\text{H}_5 + \text{H}_2\text{O} \rightleftharpoons \text{CH}_3\text{COOH} + \text{C}_2\text{H}_5\text{OH}$

Unit of rate of this reaction is

- a. $\text{mol dm}^{-3} \text{s}^{-1}$ b. $\text{mol dm}^3 \text{s}^{-1}$
c. s^{-1} d. No units

Q.23 pH of buffer in which concentrations of salt and base are 0.1M and 0.01M respectively ($\text{pK}_a = 4.0$)

- a. 3.0 b. 9.0
c. 2.0 d. 11.0

Q.24 K_{sp} for following can be written as $\text{PbCl}_2 \rightleftharpoons \text{Pb}^{+2} + 2\text{Cl}^-$

- a. $[\text{Pb}^{+2}][\text{Cl}]^2$ b. $[\text{Pb}^{+2}][2\text{Cl}]^2$
c. $[\text{Pb}^{+2}] + [\text{Cl}]^2$ d. $[\text{Pb}^{+2}][\text{Cl}]$

Q.25 Slowest step in the reaction is called

- a. Elementary step b. Rate determining step
c. Rate law d. Order of reaction

Q.26 In a reaction, $\text{A} + \text{B} \rightarrow \text{Product}$, rate is doubled when the concentration of B is doubled, and rate increases by a factor of 8 when the concentrations of both the reactants (A and c. are doubled, rate law for the reaction can be written as

- a. Rate = $k[\text{A}][\text{B}]$ b. Rate = $k[\text{A}]^3[\text{B}]$
c. Rate = $k[\text{A}]^2[\text{B}]$ d. Rate = $k[\text{A}][\text{B}]^2$

Q.27 For solubility product of solutions, solubility of salt may be equal to or less than

- a. 0.01M b. 0.05M
c. 1.0M d. 0.1M

Q.28 The rate of a chemical reaction doubles for every 10°C rise of temperature. If the temperature is raised by 50°C , the rate of the reaction increases by about

- a. 16 b. 32
c. 64 d. 08

Q.29 Rate of exothermic reaction is increased by increasing all except

- a. Temperature b. Volume of vessel
c. Surface area of reactants d. Concentration of reactants

Q.30 A catalyst works by

- a. Decreasing activation energy b. Forming stable transition state



- c. Providing alternate pathway d. All of these
- Q.31** A certain reaction has the rate equation, $\text{Rate} = k[A][B]^2$. The rate is $2.5 \times 10^{-3} \text{ mol dm}^{-3} \text{ s}^{-1}$. When $[A]$ is 0.2 mol dm^{-3} and $[B]$ is $0.050 \text{ mol dm}^{-3}$. Calculate the numerical value of rate constant
- a. 50 b. 2
c. 5.0 d. 0.05
- Q.32** Half-life of certain reaction decreases with decrease in concentration. Order of reaction is
- a. Zero order b. Second order
c. First order d. Third order
- Q.33** Following is an exothermic reaction $A + B \rightleftharpoons C + D$. Which is correct statement?
- a. Rate of reaction will increase by increasing temperature
c. Yield of C can be increased by increasing pressure
b. Rate of reaction will decrease by increasing temperature
d. Rate is not affected by adding catalyst
- Q.34** pOH values of four bases are given. Which is stronger one
- a. 12 b. 1
c. 13 d. 6
- Q.35** For the gas phase reaction $2X + Y \rightleftharpoons 2Z$ $\Delta H = -ve \text{ kJmol}^{-1}$ yield of Z at equilibrium could be increased by
- a. Increasing the pressure b. Increasing the temperature
c. Using a catalyst d. Increasing the volume
- Q.36** The solubility product of Ag_2CrO_4 is 3.2×10^{-2} at 25°C . The solubility of the compound is
- a. $2.0 \times 10^{-1} \text{ mol dm}^{-3}$ b. $2.0 \times 10^{-2} \text{ mol dm}^{-3}$
c. $1.501 \times 10^{-1} \text{ mol dm}^{-3}$ d. $1.866 \times 10^{-1} \text{ mol dm}^{-3}$
- Q.37** Which of the following species is conjugate base of H_2CO_3
- a. CO_3^{2-} b. CO_2
c. CO d. HCO_3^-
- Q.38** Which statement is incorrect
- a. Enzymes are biological catalyst b. Enzymes can be crystallized
c. Enzymes are highly specific d. Enzyme can resist the radiation
- Q.39** The specific rate constant for a reaction is $1.0 \times 10^{-4} \text{ mol dm}^{-3} \text{ s}^{-1}$ the order of reaction is
- a. Zero b. First
c. Second d. Third
- Q.40** By increasing temperature of water, its pH will
- a. Increase and water will be more acidic
c. Decrease and water will remain neutral
b. Decrease and water will be more acidic
d. No effect of temperature on pH
- Q.41** What is concentration $\left(\frac{\text{mole}}{\text{dm}^3}\right)$ of nitric acid solution having pH of 4
- a. 4 b. 10^{-4}
c. -4 d. 10^{-10}
- Q.42** If for a reaction $A + B \rightleftharpoons C + D$ $K_c = 2.0$ then rate constant of forward reaction would be
- a. 1.0 b. 0.5
c. 2.0 d. 2.5
- Q.43** The activation energy of forward reaction (E_a) is 75 kJmol^{-1} and activation energy of reverse reaction (E_a) is 50 kJmol^{-1} . What will be enthalpy change for this reaction?
- a. $+25 \text{ kJmol}^{-1}$ b. -25 kJmol^{-1}
c. $+125 \text{ kJmol}^{-1}$ d. -125 kJmol^{-1}
- Q.44** K_c value indicates that the chemical reaction reaches earlier to completion
- a. 10^{-3} b. 10^3
c. 10^{15} d. 10^{10}
- Q.45** For the following equilibrium which is true $\ell L \times m M \rightleftharpoons s S + t T$
- a. $K_c = [S]^s [T]^t / [L]^\ell [M]^m$ b. $K_p = \frac{P_S^s P_T^t}{P_L^\ell P_M^m}$



c. $K_c = \frac{C_S^s C_T^t}{C_L^l C_M^m}$

d. All of these



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- Q.46** In the following reaction the white ppt i-e artificial milk (BiOCl) disappears when
 $\text{BiCl}_3 + \text{H}_2\text{O} \rightleftharpoons \text{BiOCl} + 2\text{HCl}$
- a. More HCl is added
 b. More BiCl_3 is added
 c. More water is added
 d. Frequent removal of HCl
- Q.47** Which combination produces buffer solution at $\text{pH} < 7$ by partial neutralization with aqueous NaOH
- a. 0.01 M HI
 b. 0.01M CH_3COOH
 c. 0.01M HCl
 d. 0.01M H_2SO_4
- Q.48** Which statement is incorrect
- a. Conjugate base of a very weak acid is relatively very strong base
 c. Conjugate acid of a very weak base is relatively very strong acid
 b. Greater is the percentage ionization stronger is the base
 d. Greater is pK_a value stronger is the base
- Q.49** For which system the equilibrium constant K_c has units of (concentration) $^{+2}$
- a. $2\text{HF} \rightleftharpoons \text{H}_2 + \text{F}_2$
 b. $2\text{NH}_3 \rightleftharpoons \text{N}_2 + 3\text{H}_2$
 c. $2\text{NO}_2 \rightleftharpoons \text{N}_2\text{O}_4$
 d. $\text{PCl}_5 \rightleftharpoons \text{PCl}_3 + \text{Cl}_2$
- Q.50** $K_c = \frac{x^2}{V(a-x)}$ is true for
- a. $2\text{NO}_2 \rightleftharpoons \text{N}_2\text{O}_4$
 c. $\text{H}_2 + \text{I}_2 \rightleftharpoons 2\text{HI}$
 b. $\text{PCl}_5 \rightleftharpoons \text{PCl}_3 + \text{Cl}_2$
 d. $\text{CH}_3\text{COOH} + \text{C}_2\text{H}_5\text{OH} \rightleftharpoons \text{CH}_3\text{COOC}_2\text{H}_5 + \text{H}_2\text{O}$

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CTS - T1

Physics

1-D	11-B	21-A	31-C	41-D
2-C	12-D	22-A	32-D	42-B
3-C	13-D	23-A	33-A	43-B
4-D	14- ^{wrong} optics	24-A	34-C	44-C
5-D	15-C	25-A	35-B	45-B
6-D	16-A	26-C	36-C	46-C
7-A	17-C	27-D	37-B	47-C
8-C	18-B	28-B	38-D	48-B
9-B	19-A	29-A	39-A	49-C
10-C	20-D	30-B	40-B	50-B

Chemistry

1-B	11-D	21-B	31-C	41-B
2-D	12-C	22-A	32-A	42-A
3-A	13-B	23-B	33-A	43-A
4-D	14-D	24-A	34-B	44-C
5-B	15-C	25-B	35-A	45-D
6-A	16-B	26-C	36-A	46-A
7-D	17-B	27-A	37-D	47-B
8-C	18-C	28-B	38-D	48-D
9-C	19-D	29-B	39-A	49-B
10- ^C B	20-D	30-D	40-C	50-B